Yiming Chen

Analysis of renewable energy development to power generation in the United States

1). Aslani, A., & Wong, K.-F. V. (2014). Analysis of renewable energy development to power generation in the United States. Renewable Energy, 63, 153–161. doi:10.1016/j.renene.2013.08.047

2). Alireza Aslani works at both the University if Vaasa's Industrial Management Department and University of Miami's Department of Mechanical and Aerospace Engineering, while Kau-Fui V. Wong only works at the latter. Wong is also the current Editor in Chief of the Renewable Bioresources Journal. Aslani has published a few papers including "Application of Creativity Techniques in the Creation of Organizational Strategies" and "Development of Creativity in Concurrent Engineering Teams". Wong's highest degree is a Ph.D in Engineering from Case Western Reserve University, and has won numerous professional awards throughout his career.

3). The central topic of the article explains in details the prediction that renewable energy utilization in 2030 could create a market worth $10 billions, representing a 102% increase.

4). First of all, a robust development of an economic today requires security of energy supply. Secondly, due to energy consumption growth and dependency on fossil fuels in the United States, there will be an increasing need to diversify electricity/heat generation with help of renewables. Thirdly, a system dynamics model is built to assess the renewable energy's utilization in the United States.

5). While renewables will create a market with near 10 billion $ worth (in the costs level) in 2030, the total value of renewable energy promotion and utilization in the US will be more than 170 billion $(in the costs level) during 2010–2030.

Today one of the important factors for robust development of an economic is security of energy supply.

Due to the energy consumption growth and dependency on fossil fuels in the US, diffusion of electricity/heat generation from renewables creates an import part of the US energy policies for the future.

6). The portion of the article on the energy structure in United States was needed to show that the electricity used by electric vehicles today consumes mostly fossil fuels as primary energy supplies.

7). 84.3% of the total primary energy supply used to generate electricity in 2009 was fossil fuels.

Renewable energy resources only had 5.8% in total primary energy supply for electricity generation in the same year.

A sustainability assessment of electric vehicles as a personal mobility system

1). Faria, R., Moura, P., Delgado, J., & de Almeida, A. T. (2012). A sustainability assessment of electric vehicles as a personal mobility system. Energy Conversion and Management, 61, 19–30. doi:10.1016/j.enconman.2012.02.023

2). Ricardo Faria works in the Department of Electrical and Computer Engineering at University of Coimbra. He has published articles such as “Primary and secondary use of electric mobility batteries from a life cycle perspective” and “Impact of the electricity mix and use profile in the life-cycle assessment of electric vehicles”.

Pedro Moura is Assistant Professor at University of Coimbra and Researcher at Institute of Systems and Robotics. He has a background in Electrical and Computer Engineering, with an Engineering degree (2002) and a Ph.D. (2010) in Energy from the University of Coimbra.
He has been involved in several national projects and European projects (IEE, FP7 and EcoDesign Tenders). His publications includes articles like “Multi-faceted Assessment of a Wireless Communications Infrastructure for the Green Neighborhoods of the Smart Grid”.

Joaquim Delgado works at the Engineering and Industrial Management Program at Polytechnic Institute of Viseu. Publications includes “Integration of PEV in Portuguese distribution grid: Analysis of harmonic current emissions in charging points” and collaborations with the other authors here.

Aníbal T. de Almeida works at the Institute of Systems and Robotics at University of Coimbra. He has published near 100 papers in his career. Some of them are “A new modeling method for S-MCSRM driven by three-phase full bridge converter”, “Novel Energy Stored Single-Stage Photovoltaic Power System With Constant DC-Link Peak Voltage”, and “Comparison of Different Tapped Windings for Flux Adjustment in Induction Motors”.

3). This paper assesses the economic and environmental balances of electric vehicles as a personal mobility system from a methodology similar to life cycle assessment.

4). Early on, the article explains the difference in efficiency varying from drivetrain to drivetrain. The type of primary energy supply used for electricity generation adds a significant amount of variance to the sustainability assessment. Sustainability of driving electric vehicles also heavily depends on the driving style and use of energy-saving driving techniques.

5). In EVs the main energy losses occur at three main subsystems. At the Energy Storage System (ESS), the fuel tank equivalent in a EV; at the Powertrain (PT), the group of components that generate power and deliver it to the wheels, and at the Power Electronics Module (PEM), responsible for the motor control, charging and regenerative braking.

To correctly assess the sustainability of an EV based mobility system, the way electric energy is generated is an important factor.

electric mobility seems increasingly beneficial, both from an environmental and from a economical point of view when compared to conventional mobility.

6). Numbers provided in this article adds to that of the above article to collective build an quantitative relationship between electricity generation mix and overall sustainability of electric vehicles as a personal mobility system.

7). The specific number of grams of carbon dioxide equivalent generated by each type of energy.

Renewable energy resources can indirectly emit greenhouse gases through upstream supply stage, power plant construction, et cetera.